NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV2: 2ND FLOOR DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd	–	0.5010	0.0000
WHEELOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELOCK STROBE 30 cd	–	0.0300	0.0000
WHEELOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELOCK STROBE 75 cd	–	0.1650	0.0000
WHEELOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELOCK STROBE 110 cd	5	0.2200	1.1000
WHEELOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELOCK HORN	6	0.0870	0.5220
AUTOCALL BELL	4	0.0500	0.2000
TOTAL NOTIFICATION APPLIANCES CURRENT			1.822

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM

WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = CONSTANT
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

VD = {(1.822 A) (480FT) (21.64)}/4110 = 4.596 V

%VD = {4.596 V / 24 V} X 100 = 19.151 %

REMAINING VOLTS = 19.404

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

BATTERY CALCULATIONS FAP–01,–01A,–01B–88

ITEM	DESCRIPTION	QTY	STANDBY CURRENT PER ITEM (AMPS)	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP–35	FACP w/2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS–35	POWER SUPPLY	2	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
AA–30U	CLASS B BELL MODULE	1	0.0065	0.0065	0.0400	0.0400
AE–30U	CLASS B BELL MODULE	3	0.0065	0.0195	0.0400	0.1200
PM–32	MATRIX MODULE	3	0.0000	0.0000	0.0000	0.0000
RM–30U	RELEASE MODULE	1	0.0050	0.0050	1.5000	1.5000
SM–30	SWITCH MODULE	11	0.0000	0.0000	0.0450	0.4950
SR–32	6 RELAY MODULE	6	0.0000	0.0000	0.0450	0.2700
SR–35	8 RELAY MODULE	–	0.0000	0.0000	0.0210	0.0210
TC–30U	BATTERY TRANSFER	1	0.0300	0.0300	0.0150	0.0150
TL–30U	TIME LIMIT	2	0.0000	0.0000	0.0500	0.1000
ZN–34US	SUPERVISORY MODULE	6	0.0100	0.0600	0.1100	0.6600
ZU–35	ZONE MODULE	8	0.0090	0.0720	0.1100	0.8800
ZU–35DS	ZONE MODULE/SD's	13	0.0090	0.1170	0.1100	1.4300
SMOKE	SMOKE DETECTOR	192	0.0001	0.0192	0.0010	0.1920
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	3	0.0020	0.0060	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						5.1520
TOTAL SYSTEM CURRENT			STANDBY	0.7132	ALARM	11.5600

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) + (TOT. ALARM CURRENT X ALARM TIME)} X 1.25

MIN. BATTERY CAPACITY = {(0.7132 A X 24 HR) + (11.56 A X 0.083 HR)} X 1.25

MIN. BATTERY CAPACITY = {17.1168 AHr + 0.9595 AHr} X 1.25 = 22.5954 AHr

NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1: B'SMNT & 1ST FLOOR DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd	–	0.5010	0.0000
WHEELOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELOCK STROBE 30 cd	–	0.0300	0.0000
WHEELOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELOCK STROBE 75 cd	–	0.1650	0.0000
WHEELOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELOCK STROBE 110 cd	–	0.1100	0.0000
WHEELOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELOCK HORN	29	0.0870	2.5230
AUTOCALL BELL	8	0.0500	0.4000
TOTAL NOTIFICATION APPLIANCES CURRENT			2.9230

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM

WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = CONSTANT
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

VD = {(2.923 A) (910FT) (21.64)}/4110 = 13.979 V

%VD = {12.731 V / 24 V} X 100 = 58.247 %

REMAINING VOLTS = 10.021

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

FIRE ALARM SYSTEM FUNCTION CHART

SYSTEM EVENT \ RESPONSE	ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE 88 NOTIFICATION DEVICES	OPERATE B56W NOTIFICATION DEVICES	DOOR HOLDER RELEASE	HALON RELEASE	HALON BELL & HORN	CONTROL ROOM FAN SHUTDOWN	GAMMASPHERE TRLR PWR SHUTDOWN	CAVE 5 PWR SHUTDOWN	GRETINA TRLR PWR SHUTDOWN	CAVES 2 & 3 TRLRS PWR SHUTDOWN
88 FIRE CALL BOX	●	●			●		●							
88 HEAT DETECTOR	●	●			●		●							
88 SMOKE DETECTOR	●	●			●		●							
88 FACP SMOKE DETECTOR	●	●			●		●							
CONTROL & COMPUTER RMS SMOKE DETECTORS	●	●			●		●	●	●	●				
GAMMASPHERE TRAILER SMOKE DETECTOR	●	●			●		●				●			
CAVE 5 SMOKE DETECTORS	●	●			●		●					●		
GRETINA TRAILER SMOKE DETECTORS	●	●			●		●						●	
TRAILERS ABOVE CAVES 2 & 3 SMOKE DETECTORS	●	●			●		●							●
MANUAL HALON RELEASE	●	●					●	●	●	●				
88 FIRE SPRINKLER WATERFLOW SWITCHES	●	●			●		●							
88 FIRE SPRINKLER VALVE SUPERVISORY SWITCHES	●			●										
B88B,C,D FIRE SPRINKLER WATERFLOW SWITCHES	●	●			●									
B88B,C,D FIRE SPRINKLER VALVE SUPERVISORY SWITCHES	●			●										
B56W FIRE CALL BOX	●	●				●								
B56W FIRE SPRINKLER WATERFLOW SWITCH	●	●				●								
B56W FIRE SPRINKLER VALVE SUPERVISORY SWITCHES	●			●										
AC POWER FAILURE	●		●											
SYSTEM FAULT	●		●											

NOTIFICATION APPLIANCE CIRCUIT CURRENT

CKT AV1 – B'SMNT & 1ST FLOOR	2.923
CKT AV2 – 2ND FLOOR	1.822
CKT AV3 – RM 163 HALON	0.137
CKT AV4 – 56W	0.270
CKT AV5 –	–
CKT AV6 –	–
CKT AV7 –	–
CKT AV8 –	–
TOTAL NOTIFICATION APPLIANCES CURRENT	5.152

AS BUILT
–
–
10/29/13

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
–	LDD	LDD	MCD	10/29/13	AS BUILT

BLDG 88, B56W FIRE ALARM FUNCTION CHART & CALCULATIONS

DRAWN BY	LDD
DATE	10/29/2013
CHECKED BY	LDD
DATE	10/29/2013
APPROVED BY	MCD
DATE	10/29/2013
SCALE	AS NOTED

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWING NO. 4B88E148_
PROJECT NO. 000000

SHEET FA
1 OF 2